

REMARKS

Careful consideration has been given by the Applicants to the Examiner's comments and rejection of the claims as set forth in the outstanding Office Action, and favorable reconsideration and allowance of the application, as amended, is earnestly solicited.

Applicants note that the Examiner has again rejected the application, in that predicated on the disclosure, there is no ability disclosed concerning interconnecting the lifting or tilting cylinders with the working structure, such as the boom cylinders between the shovel and the boom pivot points, which will enable the structure, such as the shovel to be moved either vertically or tilted.

However, the minor aspects which are not shown in the drawings are deemed to be obvious to one skilled in the technology particularly engineering personnel who are concerned with disclosing and implementing the connections between these components.

Thus, all of these particular salient features are deemed to be clearly described in the specification and shown in the drawings, wherein essentially the only lacking minor aspects in the drawings pertain to the various pivot points P1, P2 as illustrated in Figures 1A, 1B, 2A, and 2B; and in Figure 3A; and pivot points P3 and P4 as shown in Figure 3B as attached hereto by way of Exhibits, represented in the marked up drawings. Also disclosed therein (i.e., the Exhibit drawings) is the minor drawing aspect relating to the connecting rod C which has now been shown in each of the drawings attached hereto as an Exhibit. All of these points representing the functional connection are deemed to be obvious to one of skill in the technology, who would be

concerned with constructing the vehicle and the operative mechanisms associated therewith concerned with moving the boom and the attached work tool, such as the shovel 6, which is clearly illustrated in the original drawings, as filed.

Consequently, these pivot points are not particularly illustrated in detail in the original drawings since it would be obvious to any engineer or designer of the equipment, that in order to render the structure operable, such pivot point connections are common and well known in the technology, and thus would be present in the overall structural configuration, without the necessity for further detailed illustrations.

Consequently, applicants respectfully submit that the drawings on file are clearly adequate in providing an operative mechanism, as may be readily understood by one of skill in the art.

Moreover, applicants note that the Examiner contends the specification sets forth that "lifting cylinders fix a lifting height or a vertical direction of movement of the working tool relative to a vehicle body". In this connection, the vertical direction movement only pertains to Claim 1 of the present application, whereas the Examiner is apparently of the opinion that when one of the piston rods is extended the other rod is retracted, such that this would cause a rotational movement other than a change in the vertical direction or height of the device or shovel 6.

Applicants respectfully draw the Examiner's attention to the aspect that from the very beginning, the inventive control and adjustment system pursuant to Figs. 1A through 2B are not adapted for the purpose of moving a part of a mobile machine linearly, vertically or, in general, linearly. Thus, in order to implement a rotational motion, contrary to the Examiner's remarks in paragraph 4 of the Office Action, that this

would be case for Fig. 1A of the drawings, that would necessitate a device which rotates at a point between the connections of the cylinders and the other structural components. At this point there must thus be provided a rotary linkage between the device and the other structural components. It is possible to employ two identical cylinders when the rotary linkage is located on a counterline between the four connecting points of the cylinders.

Applicants note that Figure 1A of the drawings is specifically directed to independent Claim 4 which pertains to a tilting mechanism, whereas Figure 1B pertains to independent Claim 1 which describes a lifting mechanism rather than a tilting mechanism. Applicants further note the Examiner's comments on page 2, third paragraph through the upper portion on page 4 of the Office Action, and this is deemed to be primarily a contradiction in terms, inasmuch as the cylinders of the present lifting mechanisms are arranged on top of each other relative to the ground; whereas in Lech, et al. (U.S. Patent No. 5,413,452) the cylinders 54 are arranged side by side relative to the ground. Contrary to the Examiner's position, applicants note that the cylinders 64 and 66 in Lech, et al. also cause a vertical movement and not only a horizontal movement.

Accordingly, applicants respectfully submit that the claims, as amended herein, clearly and patentably distinguish over the disclosure of Lech, et al. in also incorporating terminology as clearly supported by the drawing and specification pertaining to the pivot joints, the latter of which provide for the connection between the structural components of the applicable the lifting and tilting mechanisms of, respectively, independent Claims 1 and 4.

Reverting specifically to the drawings, as indicated previously by applicants, these are deemed to be adequate in connection with providing the necessary background for the operation of the present invention, taken in conjunction with the specification, and applicants respectfully request that the Examiner withdraw the objections to the specification based on the foregoing explanation and the enclosed drawings Exhibit showing that essentially the minor addition of the pivot joints (designated) "P" confirm the patentability of the present claims while based on a complete and clearly adequate disclosure. Consequently, even in the absence of implementing minor drawing corrections, which are shown in the drawings Exhibit, the drawings as presently on file are deemed to clearly support the description of the operation and structural aspects of both the lifting and tilting mechanisms of the invention as set forth in Claims 1 and 4.

Although the Examiner indicates that the drawings fail to disclose the manner in which the retraction of piston rods of piston 62 and extending the piston rod of piston 65 will rotate or, in effect, cause the shovel or boom 6 to move vertically, since it is allegedly unclear as to the manner in which the piston rods and cylinders are connected to the shovel or the boom, these cannot be connected conventionally to the shovel or boom since conventionally both piston rods would extend or retract together, as described in the present specification in the paragraph bridging pages 16 and 17 or respectively pages 24 and 25.

Thus, the present drawings only lack a more detailed showing of the piston joints between the piston rods and cylinders, and the working tool or shovel relative to the boom. It would be an obvious expedient that these connections are made by means of pivot joints, as illustrated and shown in the attached Exhibits of the drawing figures,

although as initially filed, the drawings presently clearly indicate that such pivot joints would of necessity be present. Consequently, merely a lack of presenting these minor details would not render the disclosure inadequate to one skilled in the art, since it is clear from the general structural description, that the shovel is tilted outwardly or inwardly by the tilting mechanism as shown in Figures 1A and 2A and would not be moved vertically by the components. Thus in the absence of the pivot joints, which would be a natural or obvious expedient to be provided the inventive structure, the tilting mechanism would not be operative inasmuch as the rod and cylinder would be connected to the working tool or shovel in a fixed mode. Movement of the piston rods would then be incapable of rotating the fixed working tool, wherein the working tool in the present Figures 1A and 2A, as only represented by a symbolic rectangle, could be any type of tool. Hereby, applicants have shown in the Exhibit drawings the tool to be representative as that of a shovel.

With respect to the disclosure as shown in Figures 1B and 2B, the pivot points P1 and P2, and the short connecting rod C, similar to the tilting mechanism of Figures 1A and 2A, the lifting mechanism would not be capable of operating in the absence thereof, and it is obvious that without the pivoting connections the structure would be inoperative. Consequently, one of skill in the art would immediately, upon reading the present specification and the drawings as filed, assume that such pivot connections are normally present, and wherein it is evident that the lifting mechanism accordingly lifts the boom 64 vertically. Consequently, it is apparent that if hydraulic medium is pumped via the conduit 76 into the left cylinder the boom 64 and the shovel 6 will lift

vertically, which indicates that in the drawings the boom 64 and the shovel move away from the ground.

The foregoing is also applicable to the structure illustrated in Figures 3A and 3B of the drawings.

With respect to the function and structure illustrated in these drawing Figures 3A and 3B, it is noted that there is to be effected a linear movement of the components 6 and respectively 65, inasmuch as the cylinders 62 is supported at two points on the member 4, and consequently should not implement any rotational movement. Furthermore, the specification clearly indicates that for the remainder, Figures 3A and 3B operate generally similar to those of the embodiments of Figures 1A and 1B. Accordingly, in the embodiments pursuant to Figures 3A and 3B there is no linear movement provided therein.

Basically, the invention is directed to the aspects that through the utilization of two inversely arranged and parallel operating differential cylinders, that during a movement of the boom or the shovel or a loader, the oil quantity which is conducted towards the two cylinders is just as large as the oil quantity which is displaced from the cylinders, and thereby in two cylinders can be operated in a closed circuit means of the pump.

Consequently, applicants respectfully submit that it would be unnecessary for one of skill in the art to amend the drawings inasmuch as the drawings currently on file clearly are adequate to provide an operative structure and the interconnections of the boom and work tool with the remaining hydraulic structure as to, respectively, both lifting and tilting mechanisms.

Reverting to the claims, applicants have accordingly amended the various claims as required by the Examiner, indicating in Claims 1 and 4, respectively, the incorporation of the various pivot elements which clarify the operative movement to provide respectively the tilting and lifting motions claimed in Claims 1 and 4.

However, applicants are somewhat confused with respect to the Examiner's comments that in Claims 2 and 5 last four lines are repetitive of the limitations of respectively lines 16 and 20 of Claims 1 and 4, and should apparently be deleted. However, this clearly is incorrect as Claims 2 and 5 pertain to the relationships in the diverse sizes of the pressurization faces of the various pressure chambers, and represent further limitations of, respectively, Claims 1 and 4, as also described in the present specification pertaining to the tilting mechanism 100 of Figure 1A and the lifting mechanism 200 of Figure 1B. This description relative to the differential sizes in the pressurization faces is clearly brought forth in the specification on page 12, lines 16-25 and page 20, lines 18-27 and pertain to further subject matter and distinct limiting features relative to Claims 1 and 4 from which these claims are, respectively, dependent. Consequently, applicants note that these claims are also deemed to be correct in distinguishing over Claims 1 and 4, and define further patentable features over the art.

Furthermore, Claim 6 has been amended to also meet the Examiner's requirements and provide appropriate antecedent terminology.

Moreover, with respect to Claim 24, line 3, and lines 4 and 5 as questioned by the Examiner, applicants have interchanged the designations with regard to the first and second pumps, therefore also providing for appropriate amendments being implemented

to the remaining claims which depend from Claim 24, wherein the first pump is correctly now indicated to be the second pump, and conversely, the second pump is now designated as being deemed to the first pump.


The foregoing amendment clearly and unambiguously correct all of the terminology while concurrently defining patentable subject matter over the reference of record.

Moreover, as previously indicated, the specification and drawings on file are deemed to be clear in scope and unambiguous in defining the inventive concept, whereby the Examiner's requirement for amendment of the drawings is deemed to be superfluous, and in view of which applicants respectfully request that this requirement be withdrawn.

Predicated upon the foregoing amendments and comments, applicants respectfully submit that the application is clearly deemed to be in condition for allowance, and the early and favorable reconsideration and allowance of the application is earnestly solicited.

However, in the event that the Examiner has any queries concerning the instantly submitted Amendment, Applicants' attorney respectfully requests that he be accorded the courtesy of possibly a telephone conference to discuss any matters in need of attention.

Respectfully submitted,



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Enclosure: Exhibit drawings, five (5) sheets